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09/818,505	03/28/2001	Satyandra Kumar Gupta	P20380	1575

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EXAMINER

JONES, HUGH M

ART UNIT PAPER NUMBER

2128

DATE MAILED: 05/04/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/818,505

Applicant(s)

GUPTA ET AL.

Examiner

Hugh Jones

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. Claims 1-33 of U. S. Application 09/818, 505, filed 03/28/2001 (Continuation of Application 08/927,291, filed 9/11/1997) are presented for examination.

#### **Claim Interpretations**

2. The broadest reasonable interpretation of the claim language has been give to the claims. Applicants appear to be disclosing the generalization of sheet bending to more than one piece - in other words, *scheduling*. Many claims are in fact drawn to generalized scheduling – see claim 16, for example. The general teaching of optimization of manufacturing processes, **including scheduling**, in a multi-constraint environment, and using **expert systems**, was **well known** to those of ordinary skill in the art at the time of the invention.

3. Applicants argued, during prosecution of the parent application, that the Hazama (U. S. Patent 5,822,207) reference qualified as prior art because the patent was not assigned to Amanda America.

#### **Double Patenting**

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

5. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory

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double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

6. Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1-33 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-38 of U.S. Patent No. 6,233,538. Although the conflicting claims are not identically worded, they are not patentably distinct from each other because they are directed to the same inventive concept, namely apparatus method and system for multi-purpose setup planning for sheet metal bending operations.

**Claim Rejections - 35 USC § 102**

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action: A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-3, 6-10, 13-19, 23-27, 30, 32-33 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bourne et al. (WO 96/15481 - IDS).

10. Bourne et al. disclose an intelligent system for generating and executing a sheet metal bending plan. Bourne et al. disclose an intelligent sheet metal bending system, having a cooperative generative planning system. A planning module interacts with several expert modules to develop a bending plan. The planning

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module utilizes a state-space search algorithm.

Computerized methods are provided for selecting a robot gripper and a repo gripper, and for determining the optimal placement of such grippers as they are holding a workpiece being formed by the bending apparatus. Computerized methods are provided for selecting tooling to be used by the bending apparatus, and for determining a tooling stage layout. An operations planning method is provided which allows the bending apparatus to be set up concurrently while time-consuming calculations, such as motion planning, are performed. An additional method or system is provided for positioning tooling stages by using a backage guide member which guides placement of a tooling stage along the die rail of the bending apparatus. A method is provided for learning motion control offset values, and for eliminating the need for superfluous sensor-based control operations once the motion control offset values are known. The planning system may be used for facilitating functions such as design and assembly system, which may perform designing, costing, scheduling and/or manufacture and assembly. See particularly page 41, line 21 to page 54, line 25; fig. 8-12, 20 and corresponding text.

**Claim Rejections - 35 USC § 103**

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 4-5, 11-12, 20, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bourne et al..

13. Bourne et al. disclose an intelligent system for generating and executing a sheet metal bending plan. Bourne et al. disclose an intelligent sheet metal bending system, having a cooperative generative planning system. A planning module interacts with several expert modules to develop a bending plan. The planning module utilizes a state-space search algorithm.

Computerized methods are provided for selecting a robot gripper and a repo gripper, and for determining the optimal placement of such grippers as they are holding a workpiece being formed by the bending apparatus. Computerized methods are provided for selecting tooling to be used by the bending apparatus, and for determining a tooling stage

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layout. An operations planning method is provided which allows the bending apparatus to be set up concurrently while time-consuming calculations, such as motion planning, are performed. An additional method or system is provided for positioning tooling stages by using a backgage guide member which guides placement of a tooling stage along the die rail of the bending apparatus. A method is provided for learning motion control offset values, and for eliminating the need for superfluous sensor-based control operations once the motion control offset values are known. The planning system may be used for facilitating functions such as design and assembly system, which may perform designing, costing, scheduling and/or manufacture and assembly. See particularly page 41, line 21 to page 54, line 25; fig. 8-12, 20 and corresponding text.

14. Bourne et al. does not expressly disclose the particular relationships between dimensions as claimed. At the time of the invention, it would have been an obvious matter of design choice to a person of ordinary skill in the art to consider the particular relationships because Applicant has not disclosed that they provide an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore,

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would have expected Applicant's invention to perform equally well with the Bourne et al. because the choice of relationships depends on the particular problem to be solved and such relationships would not affect the teachings disclosed in Bourne et al..

15. Therefore, it would have been an obvious matter of design choice to modify Bourne et al. to obtain the invention as specified in the claims.

**16. Claims 1-20, 23-27, 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hazama et al. (U. S. Patent 5,822,207 – cited in parent) in view of the taking of Official Notice.** Applicant has argued (during prosecution of the parent application) that this reference qualifies as prior art since Applicant has argued that the patent is not assigned to *Amada America*.

17. Hamaza et al. disclose an apparatus and method for integrating an intelligent manufacturing system with an expert sheet metal planning and bending system. The intelligent manufacturing system manages and distributes part design and manufacturing information throughout the locations of a production facility. The expert planning system includes a plurality of expert modules for proposing a bending plan, including bend sequence and tooling selections, and robot motion planning and repositioning. Through the various features and aspects of the present invention, an operator can selectively modify and adapt these integrated systems for particular bend applications, including robot-based and human assisted bending operations.



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18. Hazama et al. does not *explicitly* teach multi-part setup. However, Official Notice is taken that it was well known to those of ordinary skill in the art at the time of the invention to optimize scheduling, taking into account various constraints, using expert systems. In any case, Hazama states "The intelligent manufacturing system manages and distributes part design and manufacturing information throughout the locations of a production facility. The expert planning system includes a plurality of expert modules for proposing a bending plan, including bend sequence and tooling selections, and robot motion planning and repositioning.". Clearly, this includes more than a single part.

19. Claims 1-20, 23-27, 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeClair et al. (U. S. Patent 5,485,390 – cited in parent) in view of Wakahara et al. (U. S. Patent 5,029,462 – cited in parent) and the taking of official notice.

20. LeClair et al. disclose an inductive-deductive process design for machined parts and, in particular, disclose generic details concerning preparing setup planning (including relevant constraints) for machining of materials. A relevant passage (col. 9, lines 21-34) is recited:

"A flow chart for feature sequencing is shown in fig. 18. To determine feature sequences in each setup, we have distinguished between intersecting and non-intersecting features. Intersecting features are nested together, and their sequencing depends on tools, materials, geometric constraints, and manufacturing practice. Intersecting features are constrained sequences (i.e., a limited number of feasible sequences), while non-interacting features are usually

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unconstrained. Like setup sequencing, to determine a feature sequence, three categories of constraints: material (quality), product (safety), and process (speed), are considered. And, again we have utilized an adaptive evolutionary program to obtain an optimal or near-optimal feature sequence given these three criteria....”

21. LeClair et al. disclose generic details concerning preparing setup planning (including relevant constraints) for machining of materials. LeClair et al. do not specifically disclose that the machining involves bending of sheet metal.

However, LeClair et al disclose (col. 2, lines 58-62):

“The application is the sequencing of material removal setups, features and operations but the method is applicable to any process design problem which involves both material, geometric and/or resource constraints.”

22. Wakahara et al. disclose a method of bending a workpiece including setting a bending process and preparing bending data. Details are provided concerning the specifics of sheet metal bending. See the entire disclosure.

23. Furthermore (from col. 3, lines 35-56):

“The inductive-deductive coupling involving the use of evolutionary programs can be applied to any and all process design tasks which involve mechanical parts of all types of materials using a variety of processes.”

24. In any case, official notice is taken it would have been obvious to one of ordinary skill in the art at the time of the invention that the bending of sheet metal is a standard and well known machining process - and thus that the disclosure of LeClair et al. would be relevant as applied to sheet metal bending. Furthermore,

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Leclair et al. do not explicitly disclose discloses a single part which is to be processed. Claims 1-2 and 10-11 disclose multi-part setup - however, official notice is taken that it would have been obvious to one of ordinary skill in the art at the time of the invention to generalize setup planning for one piece of sheet metal to more than one piece of sheet metal. **In any event, LeClair et al. disclose families of parts - see discussion below.**

**As per setup and constraints;** see L: fig. 2, 4, 9-14, 17-18; col. 1, line 30 to col. 2, line 12; col. 2, line 41 to col. 3, line 33; col. 6, line 52 to end of col. 10; appendix;

**As per setup and constraints and a family of parts;** see L: fig. 2, 4, 9-14, 17-18; col. 1, line 30 to col. 2, line 12; col. 2, line 41 to col. 3, line 33; col. 6, line 52 to end of col. 10; appendix; Regarding family of parts see L: abstract; figs. 2, 6, 12, 16, 21; col. 2, lines 3-12 and 41-54; col. 3, lines 1-17; col. 5, lines 37-50; col. 6, line 55 to col. 7, line 41 [discussion of use of experience obtained via previous work on similar designs]; col. 8, lines 12-18 [clusters of similar designs].

**As per locating and tooling stages;** see L: fig. 2, 4, 6, 11, 17-20; col. 2, lines 3-12; col. 5, lines 45-50; col. 7, lines 16-41; col. 8, lines 30-46; col. 9, lines 6-55;

**As per locating and tooling stages and a family of parts;** see L: fig. 2, 4, 6, 11, 17-20; col. 2, lines 3-12; col. 5, lines 45-50; col. 7, lines 16-41; col. 8, lines 30-46; col. 9, lines 6-55; Regarding family of parts see L: abstract; figs. 2, 6, 12, 16, 21; col. 2, lines 3-12 and 41-54; col. 3, lines 1-17; col. 5, lines 37-50; col. 6, line 55 to col. 7, line 41 [discussion of use of experience obtained via previous work on similar designs]; col. 8, lines 12-18 [clusters of similar designs].

**As per constraints and positioning;** see L: fig. 4, 17-20; col. 7, lines 16-41; col. 8, lines 30-46; col. 9, lines 6-55;

**As per constraints and positioning and a family of parts;** see L: fig. 4, 17-20; col. 7, lines 16-41; col. 8, lines 30-46; col. 9, lines 6-55; Regarding family of parts see L: abstract; figs. 2, 6, 12, 16, 21; col. 2, lines 3-12 and 41-54; col. 3, lines 1-17; col. 5, lines 37-50; col. 6, line 55 to col. 7, line 41 [discussion of use of experience obtained via previous work on similar designs]; col. 8, lines 12-18 [clusters of similar designs].

**As per tolerance;** see L: fig. 4, 17-20; col. 7, lines 16-41; col. 8, lines 30-46; col. 9, lines 6-55;

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**As per tolerance and a family of parts;** see L: fig. 4, 17-20; col. 7, lines 16-41; col. 8, lines 30-46; col. 9, lines 6-55;

Regarding family of parts see L: abstract; figs. 2, 6, 12, 16, 21; col. 2, lines 3-12 and 41-54; col. 3, lines 1-17; col. 5, lines 37-50; col. 6, line 55 to col. 7, line 41 [discussion of use of experience obtained via previous work on similar designs]; col. 8, lines 12-18 [clusters of similar designs].

**As per tooling parameters and clearance;** see L: fig. 4, 17-20; col. 7, lines 16-41; col. 8, lines 30-46; col. 9, lines 6-55;

**As per tooling parameters and clearance and a family of parts;** see L: fig. 4, 17-20; col. 7, lines 16-41; col. 8, lines 30-46; col. 9, lines 6-55; Regarding family of parts see L: abstract; figs. 2, 6, 12, 16, 21; col. 2, lines 3-12 and 41-54; col. 3, lines 1-17; col. 5, lines 37-50; col. 6, line 55 to col. 7, line 41 [discussion of use of experience obtained via previous work on similar designs]; col. 8, lines 12-18 [clusters of similar designs].

**As per constraints and an intermediate shape of the part;** see L: fig. 11-12, 17-18, 20; col. 10, lines 27-41;

**As per constraints and an intermediate shape of the part and a family of parts;** see L: fig. 11-12, 17-18, 20; col. 10, lines 27-41; Regarding family of parts see L: abstract; figs. 2, 6, 12, 16, 21; col. 2, lines 3-12 and 41-54; col. 3, lines 1-17; col. 5, lines 37-50; col. 6, line 55 to col. 7, line 41 [discussion of use of experience obtained via previous work on similar designs]; col. 8, lines 12-18 [clusters of similar designs].

**As per constraints and a geometric model of the intermediate shape of the part and part/tool intersections;** see L: fig. 11-12, 17-18, 20; col. 7, lines 16-41; col. 10, lines 27-41;

**As per constraints and a geometric model of the intermediate shape of the part and part/tool intersections and a family of parts;** see L: fig. 11-12, 17-18, 20; col. 7, lines 16-41; col. 10, lines 27-41;

Regarding family of parts see L: abstract; figs. 2, 6, 12, 16, 21; col. 2, lines 3-12 and 41-54; col. 3, lines 1-17; col. 5, lines 37-50; col. 6, line 55 to col. 7, line 41 [discussion of use of experience obtained via previous work on similar designs]; col. 8, lines 12-18 [clusters of similar designs].

### **Allowable Subject Matter**

25. Claims 21-22, 28-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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**26. Any inquiry concerning this communication or earlier communications from the examiner should be:**

**directed to:**

Dr. Hugh Jones telephone number (703) 305-0023, Monday-Thursday 0830 to 0700 ET, *or* the examiner's supervisor, Kevin Teska, telephone number (703) 305-9704. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

**mailed to:** Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:** (703) 308-9051 (for formal communications intended for entry)

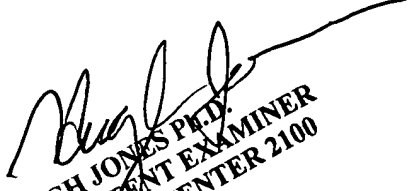
***or***

(703) 308-1396 (for informal or draft communications, please label "PROPOSED" or "DRAFT").

Dr. Hugh Jones

Primary Patent Examiner

May 2, 2004

  
HUGH JONES P.D.  
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